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providing a wet etching to remove a final one of said multiple layers; and
providing a base region above said collector region in the horizontally etched area;
providing an emitter region above the base region so that the emitter, base and collector
regions are super self-aligned.

Q2
Sub B2

8. (Amended) A super self-aligned bipolar transistor apparatus, comprising:
a semiconductor substrate having a buried collector region;
multiple layers above said collector region;
an emitter window mask above said multiple layers;
a doped collector region wherein the width of the doped collector region are equal to the
emitter window mask width;
a horizontally etched region of one of said multiple layers, wherein the dimensions of the
horizontally etched region determine that the dimensions of the base region are wider than the
doped collector region and the emitter region of the transistor;
a base region above said collector region in the horizontally etched region;
an emitter region above the base region so that the emitter, base and collector regions are
super self-aligned.

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18. (Amended) A method for forming a super self-aligned bipolar transistor, comprising the
steps of:
providing a silicon semiconductor substrate having a buried collector region;
providing a first oxide layer, a polysilicon layer, and a second oxide layer above said
collector region;
providing a Nitride emitter window mask above said oxide and polysilicon layers;
providing a wet etching with hydrofluoric acid solutions to etch said first and second
oxide layers;

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providing a horizontal plasma etching of said polysilicon layer, wherein the dimensions of the horizontally etched region determine that the dimensions of the base region are wider than the doped collector region and the emitter region of the transistor;

providing a doping of said collector region wherein the doped collector region is determined by the emitter window mask;

providing a base region above said collector region in the horizontally etched area; wherein the base region extends horizontally beyond the doped collector region;

providing an emitter region above the base region so that the emitter, base and collector regions are super self-aligned.

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21. (New) A method for forming a super self-aligned bipolar transistor, comprising the steps

of:

providing a semiconductor substrate having a buried collector region;

providing multiple layers above said collector region;

providing an emitter window mask above said multiple layers;

providing three vertical etchings of said multiple layers;

providing a doping of said collector region wherein the doped collector region is determined by the emitter window mask;

providing a horizontal etching of one of said multiple layers, wherein the step of providing a horizontal etching determines that the dimensions of the base region are wider than the dimensions of the doped collector region and the emitter region;

providing a wet etching to remove a final one of said multiple layers; and

providing a base region above said collector region in the horizontally etched area;

providing an emitter region above the base region so that the emitter, base and collector regions are super self-aligned.

22. (New) The method of claim 21 wherein the horizontal etching is performed to a distance greater than the polysilicon layer thickness, and whereby the distance may be conformed to provide desired electrical characteristics. ~~B~~

23. (New) The method of claim 22 wherein the desired electrical characteristics are transistor gain and frequency response.
